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ABSTRACT

This experiment was designed to determine how oral report activities, following exposure to an informative message, can influence children's retention of topical and factual information from the message. The message was a prose passage about modes of transportation. Second grade students (N=51) were subjects. A third of the children presented oral reports on the contents of the message (speaker condition); a third listened to the reports (listener condition); and a third functioned as controls. Retention was assessed one and three days later. As predicted, speakers' free recall of topical information and cued recall of factual information exceeded that of listeners and controls. The production of related new topics during free recall tended to increase over the retention interval. The results support the notion that covert editing activities, stimulated by the active, overt reconstruction of stored information, lead to the formation of a highly efficient retrieval system. (Author)

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Children's Retention of Topical and Factual Information Following Oral Report Activities[1]

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Abstract

This experiment was designed to determine how oral report activities, following exposure to an informative message, can influence children's retention of topical and factual information from the message. The message was a prose passage about modes of transportation. Fifty-one second grade students were subjects. One-third of the children presented oral reports on the contents of the message (speaker condition), one-third listened to the reports (listener condition), and one-third functioned as controls. Retention was assessed one and three days later. As predicted, speakers' free recall of topical information and cued recall of factual information exceeded that of listeners and controls. The production of related new topics during free recall tended to increase over the retention interval. The results support the notion that covert editing activities, stimulated by the active, overt reconstruction of stored information, lead to the formation of a highly efficient retrieval system.

Children's Retention of Topical and Factual Information Following Oral Report Activities

Much of the learning which takes place during the primary-school years occurs as a result of listening to the oral discourse of the classroom teacher. Acquisition and consolidation of new knowledge are constrained because reading and writing skills are in their formative stages. Given these conditions, a question of significant educational importance is: How can designers of early-childhood curricula ensure that new information is efficiently and meaningfully integrated into a child's existing, albeit rudimentary, knowledge structure? One means to ensure that such integration takes place is to impose requirements that certain student-generated learning behaviors, high in terms of their mathemagenic function (Rothkopf, 1970; Rothkopf & Billington, 1975), be systematically exercised in the classroom.

The mathemagenic function of classroom learning strategies refers to their utility with respect to the integration of new information into present knowledge structures. Some learning strategies have been found to operate upon several encoding levels simultaneously (Anderson & Biddle, 1975; Glynn & Di Vesta, 1977; Rickards & Di Vesta, 1974). Student-generated learning behaviors of significant mathemagenic value are those which lead to the encoding of new information not only at a subordinate, factual level of meaning but at a superordinate, general level as well.

Conversational behaviors, that is, speaking and listening, are strong candidates for planned mathemagenic usage in the elementary-school classroom because relative competencies are acquired much earlier within this domain than they are in other areas. For example, at least one summary of research

findings indicates that it is not until the seventh grade, when basic decoding skills are thoroughly mastered, that reading comprehension approximates listening comprehension in efficiency (Sticht, Beck, Hauke, Kleiman, & James, 1974). Oral report research has focused mainly on college-student populations. Ross & Di Vesta (1976) found that, among college students who read a prose passage, those who orally reported on its content to their peers tended to recall passage information much better than those who passively listened to reports. The latter, in turn, recalled more information than controls who experienced no review activity after passage reading. The authors suggested that the speaking and listening activities associated with oral reports provide reviews for a learner which "prime, stabilize, and limit the available products of processing" (p. 694). Unfortunately, functional properties of these products of processing, such as, their "height" in the idea structure of the passage (cf. Dooling & Christiaansen, 1977) were not identified.

The position advocated in the present study is that oral report strategies, by capitalizing on the relatively proficient conversational skills of primary-school pupils, can be used to augment referential knowledge at various levels of specificity. The oral report strategies are assumed to accomplish their mathemagenic function by stimulating review and organizational processes (Ross & Di Vesta, 1976). For example, associated with the experience of listening to an oral report are passive review processes which, under certain circumstances, can facilitate the rehearsal of previously acquired information. In the present study, it is anticipated that the retention of previously processed units of information can be enhanced via a listening experience which is analogous to a second learning trial. The

most pronounced gains in retrieval efficiency, however, are expected to be exhibited by children who generate oral reports on the basis of previously encoded information. These gains will be largest because children who produce oral reports engage active organizational processes in addition to the aforementioned passive review processes. Children required to communicate a message to peers will presumably operate upon memorially stored information in ways designed to enhance the stability of its internal representation. As a consequence of engaging these active organizational processes, the available information stored in the knowledge structure, that is, the topical and factual products of processing, may be rendered more accessible to children who generate oral reports than to children who only listen to them.

Method

Subjects

The subjects were 51 second-grade students (23 girls and 28 boys) randomly chosen from three homerooms of a public elementary school in a rural Pennsylvania school district.

Design

A 3 x 2 analysis of variance was implied by the design of the study. The between-subjects variable was oral report activity (speaking vs. listening vs. control) and the within-subjects variable was retention interval (one day vs. three days).

Initial Message

A 908-word passage about past and present modes of transportation was read aloud to the children. In passage sentences, 24 specific referential items of information (i.e., the "facts") were associated with 19 modes of land, water, and air transportation (i.e., the "topics"). For example,

associated with the topic "trains" was the following factual item: "Train tracks are made of steel." Each topic had associated with it at least one fact. Passage sentences were worded such that no dependence upon surrounding context was necessary to make any one of them comprehensible.

Procedure

The 51 children were assembled in a large classroom for the initial presentation of the message. They were told the purpose of the exercise was to acquaint them with different means of transportation used today and in the past. They were not informed of post-message oral report activities or later tests of retention.

After message reception, each child was randomly assigned to a post-message activity of either speaking, listening, or acting as a control. Each subject who was to participate as a speaker was paired, on a random basis, with a counterpart designated to participate as a listener. The speaker was instructed to "tell all you can remember about the transportation story" to a listener, who was told to "listen quietly and pay close attention" to the former's report. The speaker-listener transaction was witnessed by only the experimenter. An acceptable report was one whose duration exceeded one minute. The reports of all children satisfied this criterion. The average oral-presentation duration was about three minutes with no report requiring more than five minutes.

Controls returned to their normal school activities immediately after initial message reception. Speakers, listeners, and controls were not informed that there were to be later tests of retention. Retention measures were administered to all children on an individual basis one day and three days later.

Retention Measures

Free recall of topics. The child was required to recall aloud in any

order the topics (i.e., modes of transportation) of the initial message. The recalled topics were classified as either reproductive or productive. Reproductive topics were modes of transportation recalled verbatim from the message.

Productive topics were thematically related retention errors. It was assumed that in processing discourse, the learner's knowledge and the informational input are engaged interactively, resulting in the generation of new information during retrieval (c f. Dooling & Christiaansen, 1977). Hence, productive topics were reported modes of transportation that were not mentioned in the message, yet were reasonable in light of the theme of the message. Reported importations included "motorcycles," "rocketships," "roller skates," and "canoes."

Cued recall of facts. Pilot work indicated that for present purposes a free-recall test was not the most appropriate measure of a child's factual knowledge. Detailed facts were not verbalized as readily as the more general topics. When a child was directly queried, however, it was apparent that much of the factual material was indeed available. A cued-recall procedure was therefore implemented to render this available information more accessible.

Twenty-four completion-type statements which paralleled the 24 referential items of information in the message were read aloud to each individual. A child was asked to respond with the one or two word element necessary to complete the item. In the construction of the referential items from which the completion-type statements were derived, care was taken to avoid response elements which had synonyms frequently associated with them. Only verbatim responses were scored as correct.

Results

A 3 x 2 mixed analysis of variance was conducted upon each of the

following: Reproductive topic free-recall scores, productive topic free-recall scores, and factual item cued-recall scores. Experimental group means for each retention measure are presented in Table 1. Mean scores in Table 1 are collapsed over retention interval since this factor was not found to be significant in any of the main analyses. Comparisons of means were made via Fisher's least significant difference procedure (Kirk, 1968).

Insert Table 1 about here

Free Recall of Reproductive Topics

The main effect of oral report activity on free recall of reproductive topics was significant, F (2, 48) = 3.22, $p < .05$, MS_e = 6.48. As expected, speakers' recall exceeded that of both listeners and controls ($p < .05$). Listeners' recall did not differ significantly from that of controls. The main effect of retention interval and the Oral Report Activity x Retention Interval interaction were not significant.

Free Recall of Productive Topics

Productive topics were few in number compared to reproductive topics. Importations increased over the retention interval from one day (M = 0.53) to three days (M = 0.77), but the difference fell short of statistical significance, $p < .09$. The main effect of oral report activity and the interaction effect were not significant.

Cued Recall of Factual Items

The analysis of cued factual recall scores yielded a significant effect for oral report activity, $F(2, 48) = 4.22$, $p < .02$, $MS_e = 32.48$. As anticipated, speakers' recall was superior to that of both listeners ($p < .05$) and controls ($p < .01$). Listeners tended to recall more factual items than controls but the difference was not significant.

Discussion

The delivery of an oral report following the reception of the informative message positively influenced the later retrieval of the content of the message. The process of reconstructing the message aloud for the benefit of an audience apparently induced individuals to actively process stored information. Rudimentary organizational schemata were reworked and transformed into structures of comparatively high retrieval efficiency.

Speakers' free recall of reproductive topics was superior to that of listeners and controls. In order to communicate material accurately to their comrades, speakers subjected stored information about the initial message to further processing. They presumably engaged in covert editing activities which nourished the development of sound organizational structures. Editing activities may include the following: arrangement of retrieved information to insure that output follows a logical (i.e., temporal or hierarchical) sequence, transformation of retrieved information to comply with accepted grammatical and syntactical rules, and censorship of dubious details to preserve output accuracy. Logically, the retrieval advantage speakers experienced with respect to the topics of the message should extend to the facts subsumed by those topics. This was found to have occurred. Speakers' retention of factual material was about 12% greater than that of listeners and about 16% greater than that of controls. Thus, it may be concluded that active, overt reconstruction of previously encoded information evokes the formation of a highly efficient retrieval system.

Contrary to our expectations, the passive review made possible by the listening experience had little effect on the retention of either topical or factual products of processing. One explanation for the ineffectiveness of the passive review is that listeners may have "turned off" speakers as

soon as they heard information which conflicted with what they had themselves encoded. On several occasions we observed that a listener interjected a word during a speaker's rendition. The experimenter quickly used a finger-to-lip gesture to remind the child of the silence requirement. It was apparent that the intent of the listener was to correct a detail inaccurately reported by the speaker. These observations lend support to the notion that some listeners filtered out the speakers' words.

Productive topics tended to increase over the course of the retention interval. If memory for discourse is viewed as a constructive process (Anderson, 1977; Bartlett, 1932; Cofer, Chmielewski, & Brockway, 1976; van Dijk & Kintsch, in press) then such increments are to be expected. During initial encoding and later retrieval, conceptually related stores of information are activated. The interaction of old and new knowledge leads to the production of contextually appropriate retention errors. The quantity of productive as opposed to reproductive topics was small because the children likely perceived the demands of the task to be reproductive (c f. Spiro, 1977). Had the children been encouraged to guess, it is likely that the number of productive topics generated would have been magnified. For pedagogical purposes, it is important to note that the modes of transportation that the children constructed were all valid means of transportation. Primary-school pupils should not be penalized by an undue emphasis placed upon reproductive learning. Early-childhood educators who design curricula and assessment devices should be alert to the processes which underlie comprehension. When these processes are allowed to operate freely, newly acquired information can be combined with established information to arrive at legitimate new products.

References

Anderson, R. C. The notion of schemata and the educational enterprise. In R. C. Anderson, R. J. Spiro, & W. E. Montague (Eds.), Schooling and the acquisition of knowledge. Hillsdale, N J.: Erlbaum, 1977.

Anderson, R. C., & Biddle, W. B. On asking people questions about what they are reading. In G. Bower (Ed.), Psychology of learning and motivation (Vol. 9). New York: Academic Press, 1975.

Bartlett, F. C. Remembering. London: Cambridge University Press, 1932.

Cofer, C. N., Chmielewski, D. L., & Brockway, J. F. In C. N. Cofer (Ed.), The structure of the human memory. San Francisco: W. H. Freeman, 1976.

Dooling, D. J., & Christiaansen, R. E. Levels of encoding and retention of prose. In G. H. Bower (Ed.), The psychology of learning and motivation. New York: Academic Press, 1977.

Glynn, S. M., & Di Vesta, F. J. Outline and hierarchical organization as aids for study and retrieval. Journal of Educational Psychology, 1977, 69, 89-95.

Kirk, R. E. Experimental design: Procedures for the behavioral sciences. Belmont, Calif.: Brooks/Cole, 1968.

Rickards, J. P., & Di Vesta, F. J. Type and frequency of questions in processing textual material. Journal of Educational Psychology, 1974, 66, 354-362.

Ross, S. M., & Di Vesta, F. J. Oral summary as a review strategy for enhancing recall of textual material. Journal of Educational Psychology, 1976, 68, 689-695.

Rothkopf, E. Z. The concept of mathemagenic behaviors. Review of Educational Research, 1970, 40, 325-336.

Rothkopf, E. Z., & Billington, M. J. A two-factor model of the effect of goal-descriptive directions on learning from text. Journal of Educational Psychology, 1975, 67, 692-704.

Spiro, R. J. Remembering information from text: The "state of schema" approach. In R. C. Anderson, R. J. Spiro, & W. E. Montague (Eds.), Schooling and the acquisition of knowledge. Hillsdale, N.J.: Lawrence Erlbaum Associates, 1977.

Sticht, T. B., Beck, L. J., Hauke, R. N., Kleiman, G. M., & James, J. H. Auding and reading: A developmental model. Alexandria, Va.: Human Resources Research Organization, 1974.

van Dijk, T. A., & Kintsch, W. Cognitive psychology and discourse: Recalling and summarizing stories. In W. U. Dressler (Ed.), Trends in text linguistics. New York and Berlin: de Gruyter, in press.

Table 1

Mean Scores for Oral Report Activity Conditions

on Three Measures of Retention

Retention Measures	Oral Report Activity		
	Speaking (n=17)	Listening (n=17)	Control (n=17)
Free Recall of Topics			
Reproductive	6.79	5.32	5.53
Productive	0.47	0.62	0.85
Cued Recall of Facts	10.32	7.50	6.44

Note. Scores collapsed over retention interval. Maximum reproductive topic score = 19; maximum fact score = 24.